

A319/A320/A321
TECHNICAL TRAINING MANUAL
SA Family to A319/A320/A321 PW1100G - T1+T2
28-FUEL

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Fuel IDG Cooling System Presentation (A319/A320 PW1100G).....	2
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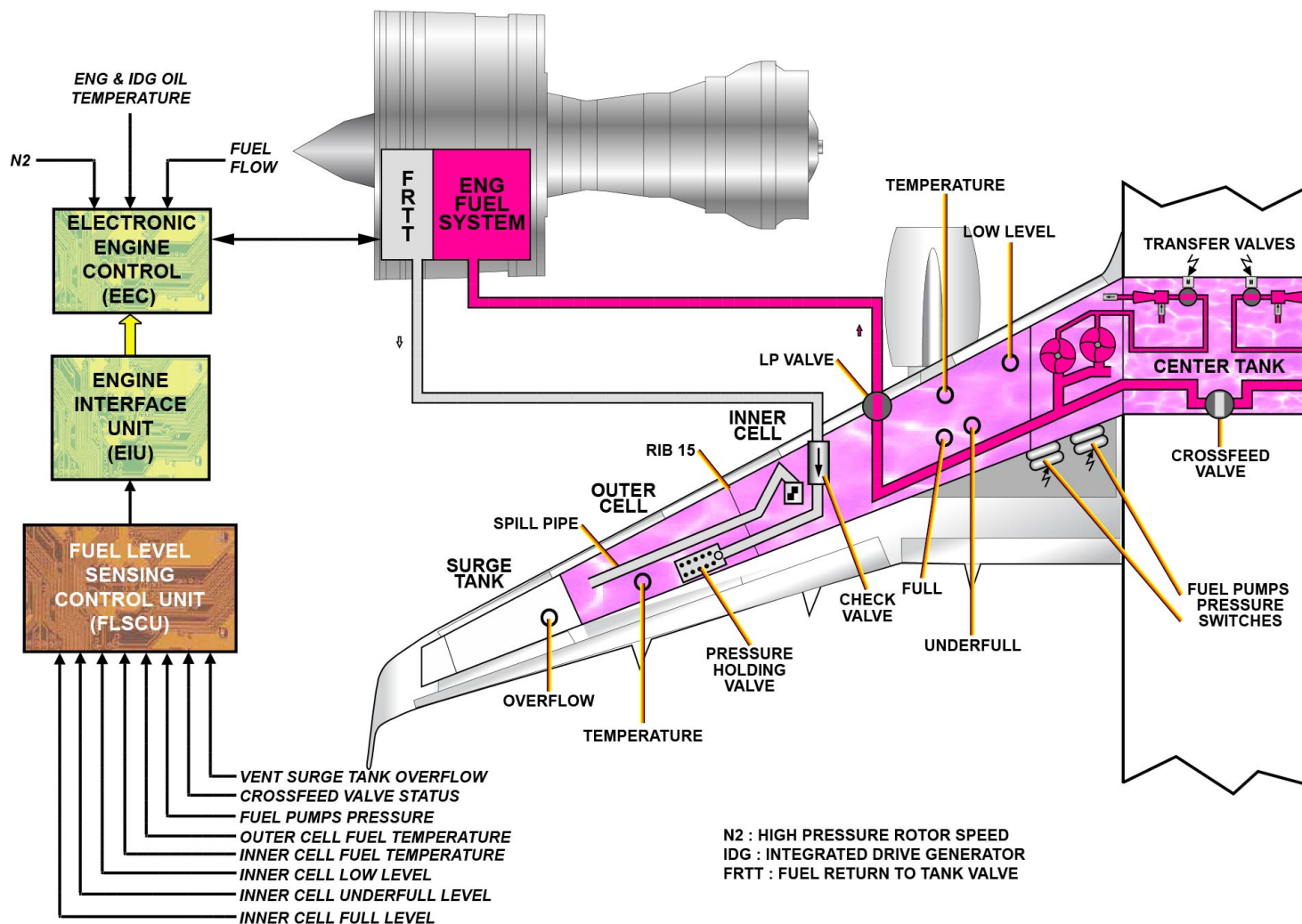
FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

B2 SCOPE

CAUTION: MODULE TAGGED B2 SCOPE.
BE AWARE THAT ONLY AVIONICS/ELECTRICAL TOPICS
SHOULD BE LEARNED FOR A T2 COURSE.

PRINCIPLE

The temperature of the Integrated Drive Generator (IDG) oil is decreased by fuel through a recirculation system. Some of the fuel that supplies the engines is used to decrease the temperature of the IDG oil. A Fuel Return To Tank valve (FRTT) lets the hot fuel return to the outer cell. The FRTT opens the fuel flow back to the aircraft tank in special engine configurations (N2, fuel flow...). The return valve mixes the hot fuel with cold fuel from the Low Pressure (LP) fuel pump to keep the temperature of the returned fuel less than 100°C (212°F). The Fuel Level Sensing Control Unit (FLSCU) 1 and the Engine Electronic Control (EEC) 1 control the recirculation system in the left wing. FLSCU 2 and EEC 2 control the right wing system.



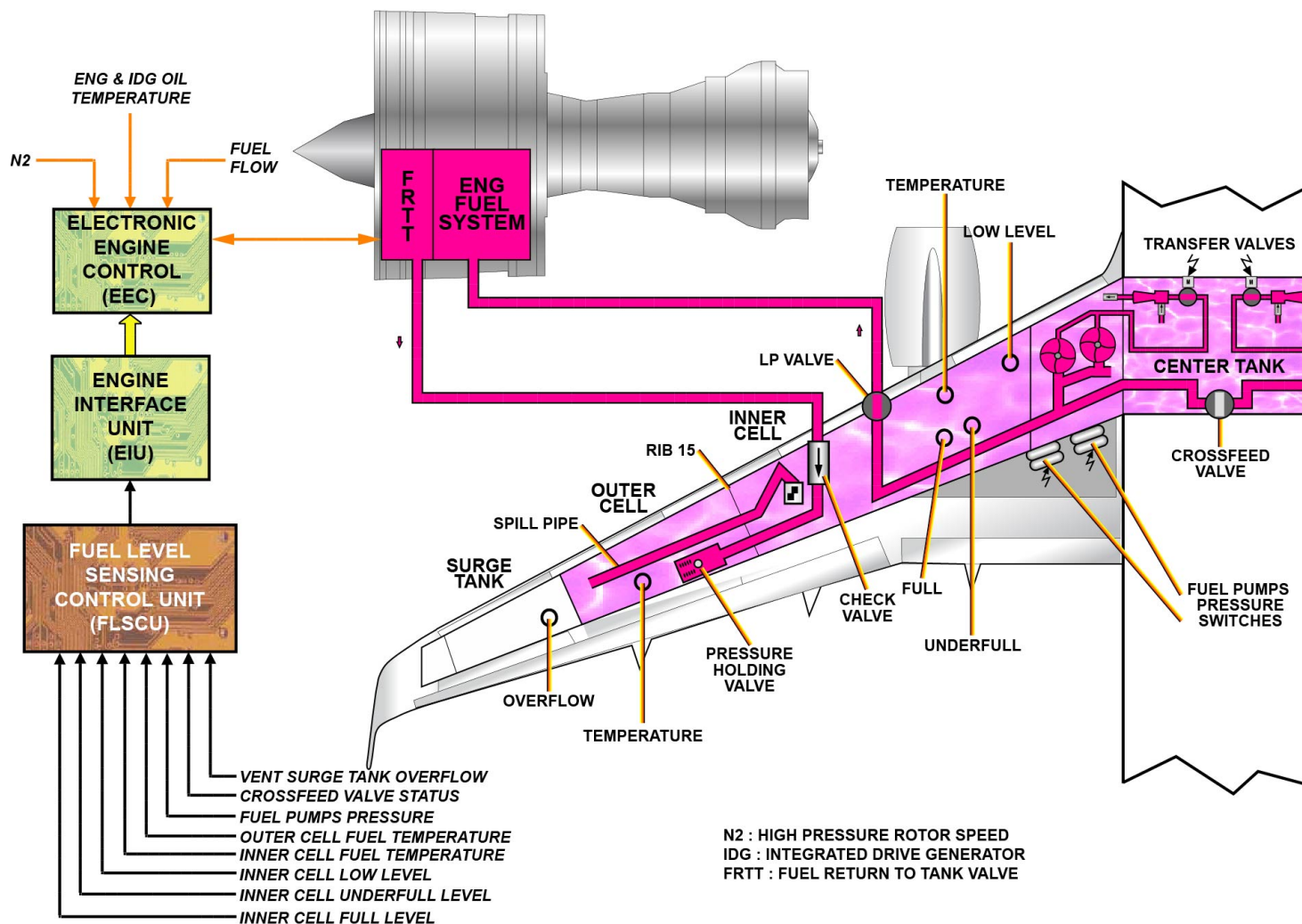
B2 SCOPE & PRINCIPLE

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN

The recirculated fuel is sent to the outer cell through a check valve and a pressure-holding valve to not let the fuel get to boiling temperature. The pressure-holding valve keeps a pressure of 15.5 psi in the return line. If the pressure increases, fuel bleeds through the valve into the outer cell. The check valve prevents fuel flow from the wing tank to the engine when the recirculation system is not in operation.

NOTE: Note: When the outer cell is full, the fuel overflows into the inner cell through a spill pipe.

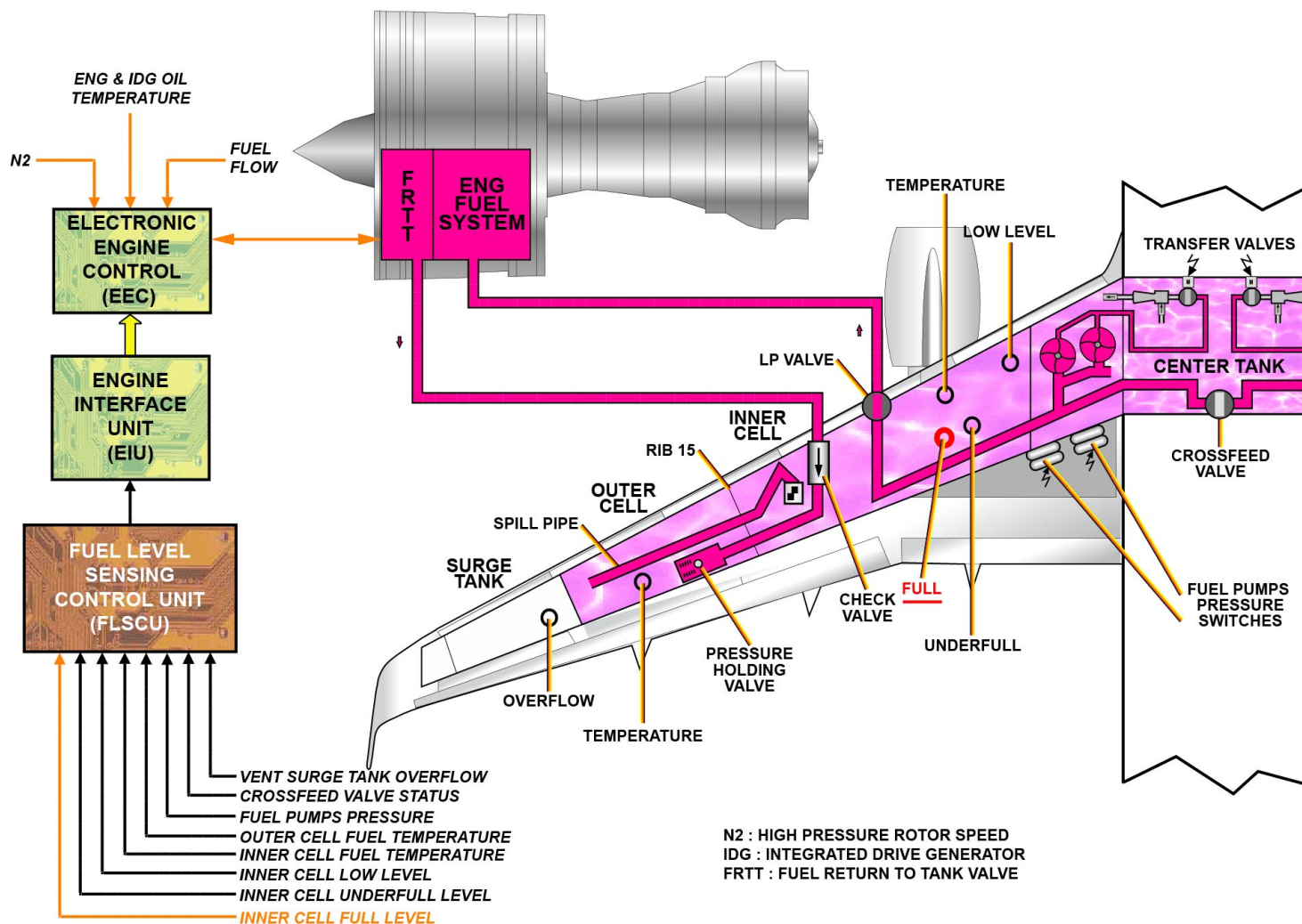


FUEL RETURN

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

PUMP LOGIC

While fuel is supplied from the center tank, the wing tanks will stay full and will possibly overfill because the returned fuel is supplied to the wing tanks. If this occurs, the center tank transfer valves close when the inner cell gets to the FULL level sensor. The wing tank pumps will supply the fuel to the engine until approximately 500 kg (1100 lbs) of fuel are used and the UNDERFULL sensor is reached. The logic circuit then open the center tank transfer valves again.



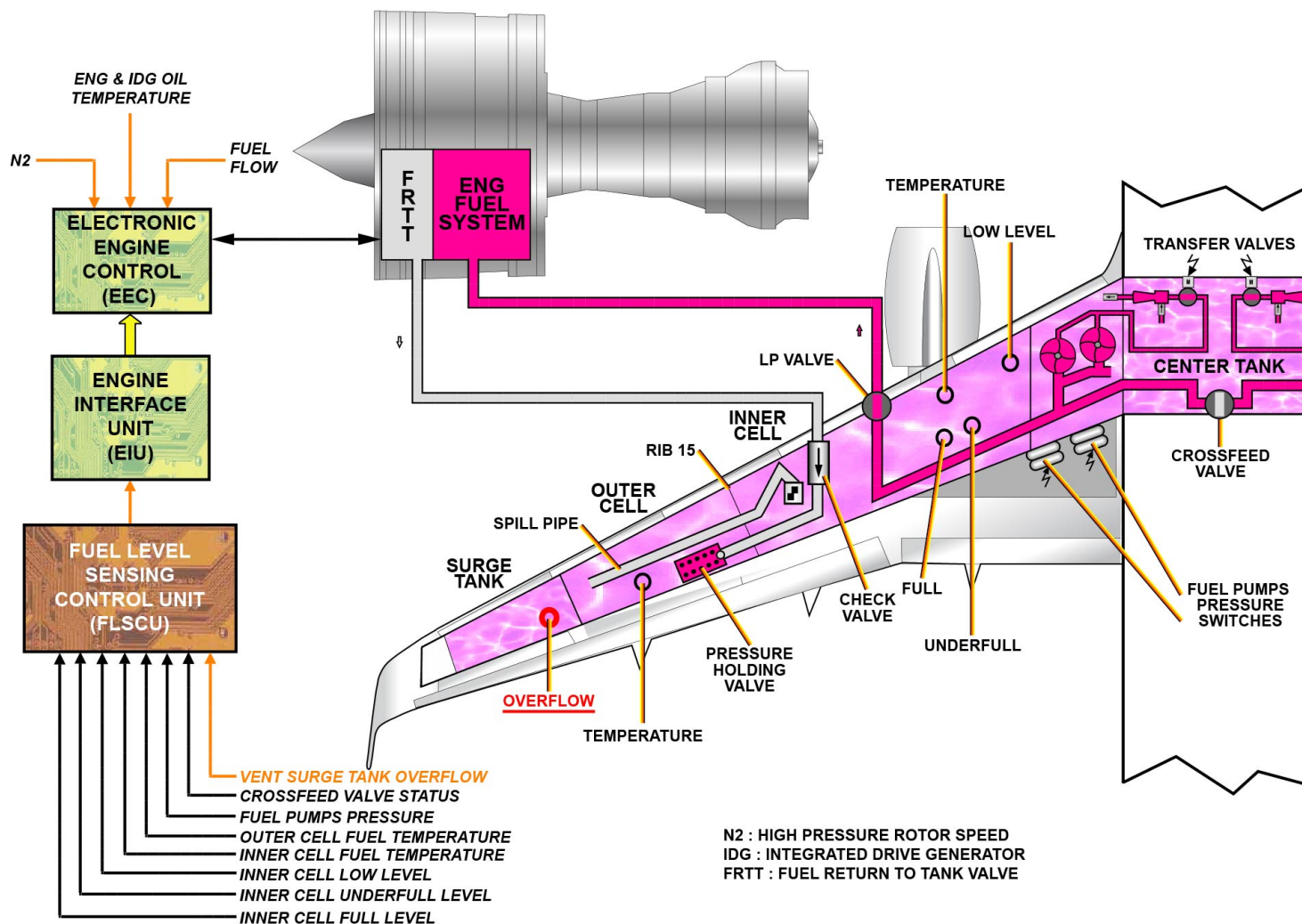
PUMP LOGIC

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN TO TANK VALVE CLOSURE

OVERFLOW

The FRTT closes if the center tank transfer valves do not obey the logic signals of the full level sensors. This causes the wing tank to overflow through the tank ventilation system into the vent surge tank. The overflow sensor sends an electrical signal to the FLSCU. The FLSCU sends a closure signal to the EEC through the Engine Interface Unit (EIU). The EEC closes the FRTT and stops the fuel supply back to the outer cell.



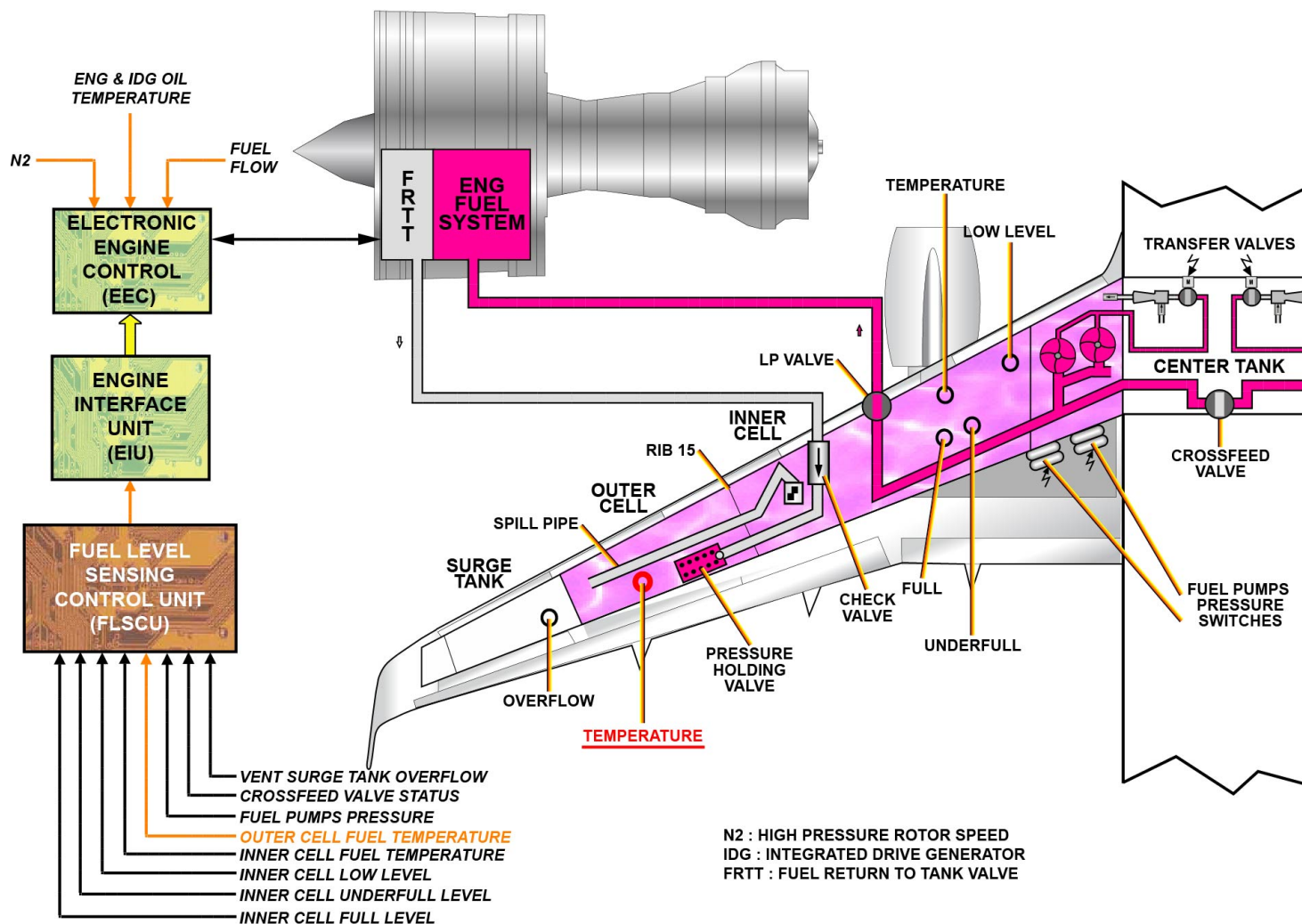
FUEL RETURN TO TANK VALVE CLOSURE - OVERFLOW

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

OUTER CELL HIGH TEMPERATURE

The FRTT closes if the fuel temperature is too high in the outer cell, i.e. 52.5°C (126.5°F). Because the returned fuel from the engine is hot, the FLSCU prevents an overtemperature in the wing tanks. The FLSCU sends a closure signal to the EEC through the EIU. The EEC closes the FRTT and stops the fuel supply back to the outer cell.



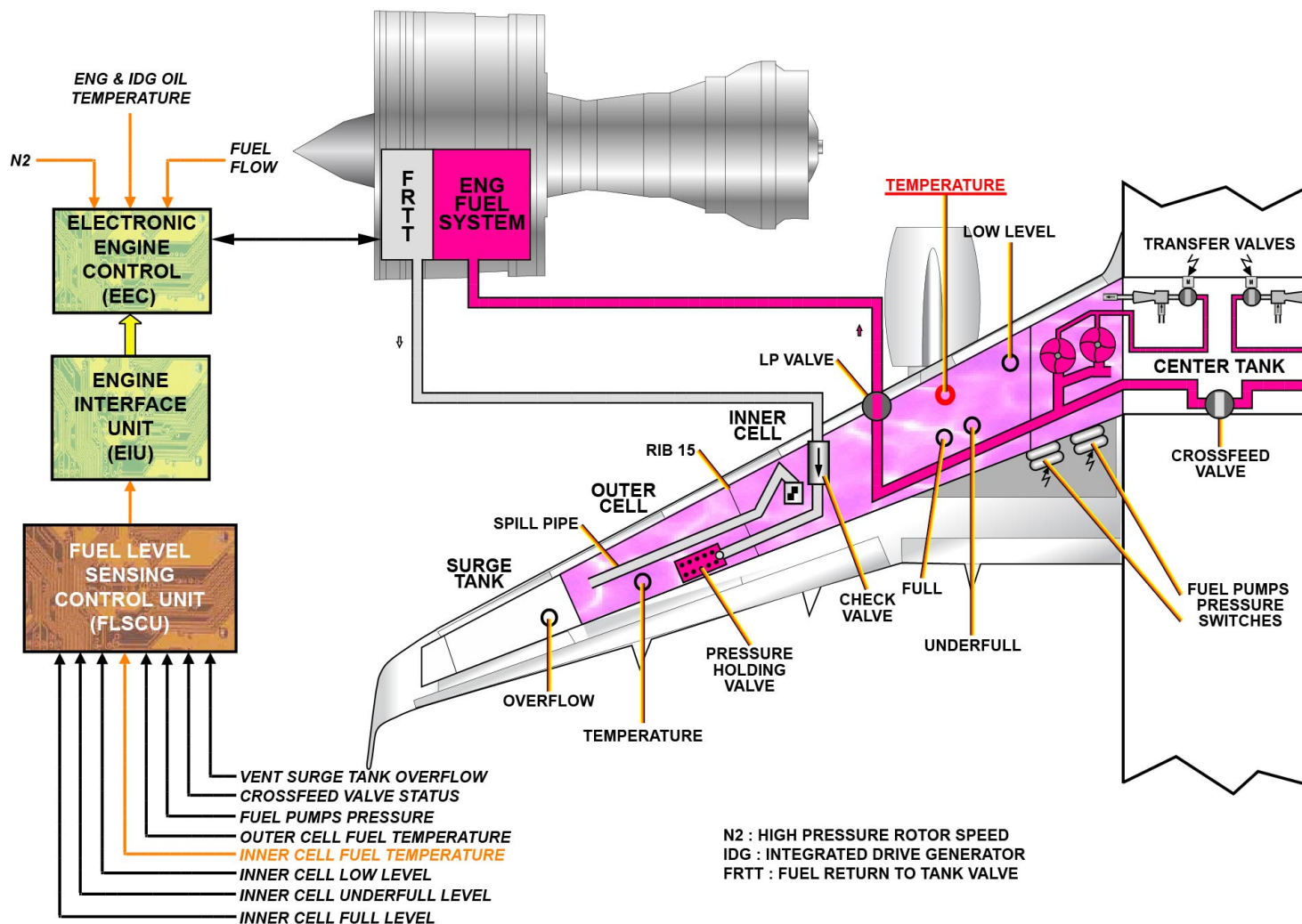
FUEL RETURN TO TANK VALVE CLOSURE - OUTER CELL HIGH TEMPERATURE

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

INNER CELL HIGH TEMPERATURE

The FRTT closes if the fuel temperature in the inner cell is too high, i.e. 55°C (131°F). Thus a large volume of high-temperature fuel will not go into the inner cell if the intercell valve opens. This also keeps the fuel temperature at an acceptable level if a tank rupture occurs.



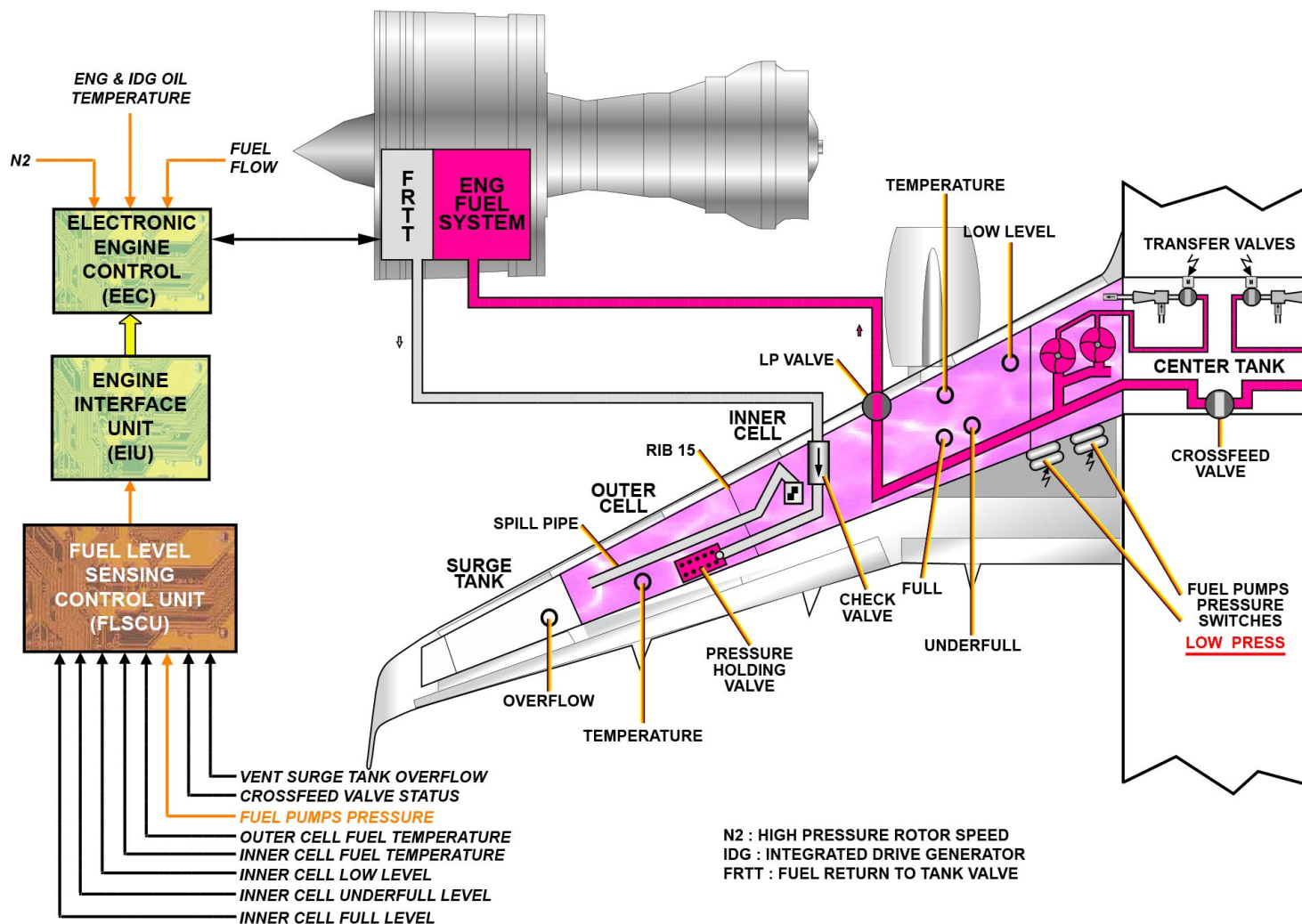
FUEL RETURN TO TANK VALVE CLOSURE - INNER CELL HIGH TEMPERATURE

FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

PUMP PRESSURE LOSS

The FRTT closes if a fuel pump Low Pressure (LP) is sensed by all pump pressure switches of one wing for the related engine when the crossfeed valve is closed, or if a fuel pump LP is sensed by all pump pressure switches of the two wings when the crossfeed valve is open. This is to stop the return fuel flow during engine gravity feeding. LP is sensed by the pump LP switch and a signal is sent to the FLSCU.



FUEL RETURN TO TANK VALVE CLOSURE - PUMP PRESSURE LOSS

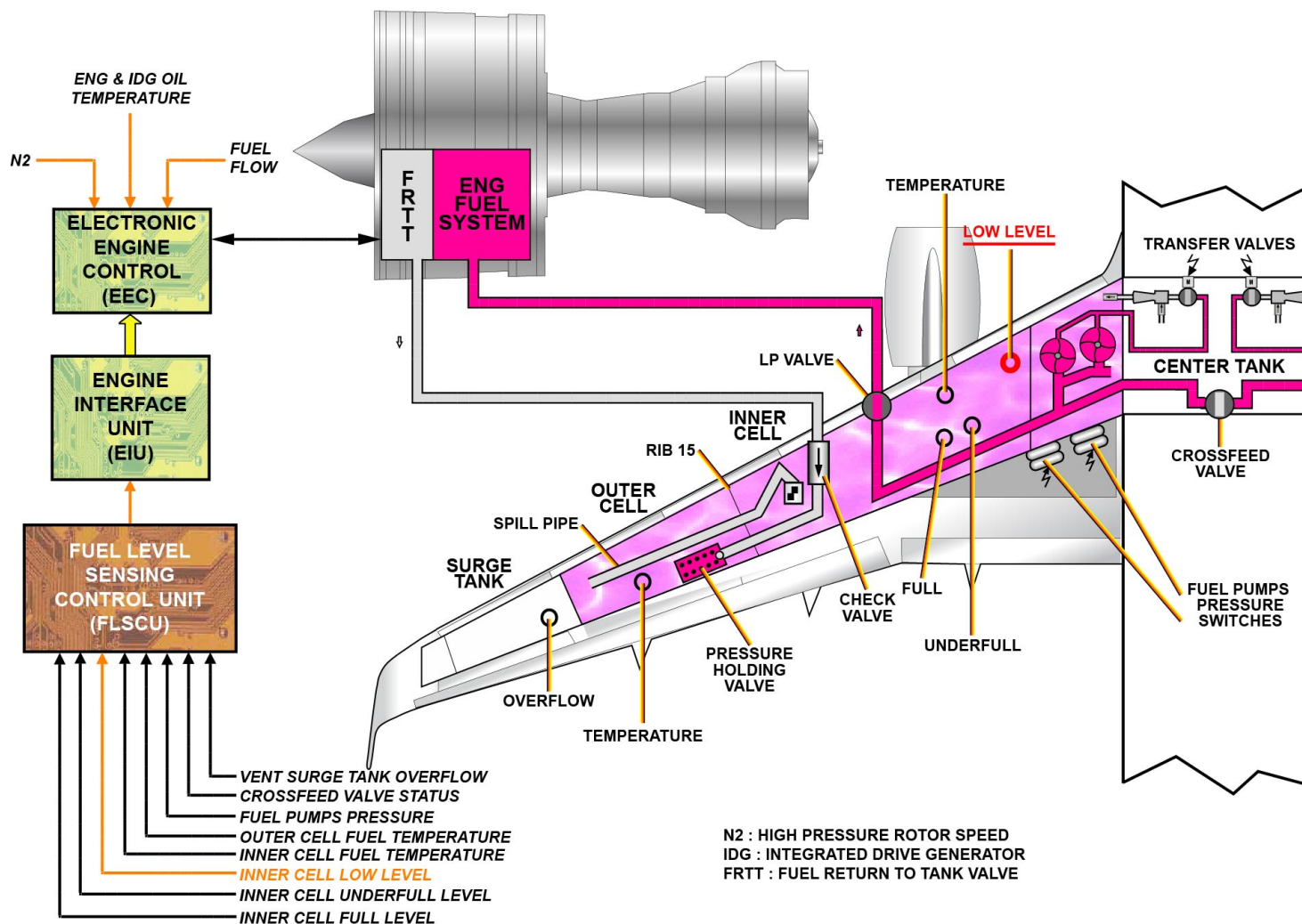
FUEL IDG COOLING SYSTEM PRESENTATION (A319/A320 PW1100G)

FUEL RETURN TO TANK VALVE CLOSURE (continued)

LOW LEVEL

The FRTT closes when the fuel level in the inner cell decreases to the INNER LOW LEVEL sensor at 280 kg (620 lbs).

NOTE: Note: When the FRTT closes, this decreases the quantity of fuel that cannot be used.



FUEL RETURN TO TANK VALVE CLOSURE - LOW LEVEL



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